

Test, Edit, Repeat:

Steps to Your



Improve Web Site

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by Stephanie Willen Brown

I have written hundreds of memos, letters, and reports in my professional career. Each of these documents required at least two or three drafts before the text was suitable for its audience. Web site design is similar in process: A library's first Web page may be functional and get its point across, but it may take several iterations to properly serve its audience. I studied Web site usability prior to becoming the database services librarian for Hampshire College in Amherst, Massachusetts, in August 2000 and was eager to apply this, along with my print editing skills, to Web design.

The Hampshire library Web site is an integral part of our reference service (online at <http://library.hampshire.edu>). The college enrolls approximately 1,150 undergraduate students who often do interdisciplinary research. Our staff is made up of six librarians and a director, and we all do a variety of library tasks. We share duties at the reference desk, so we are all interested in the role of the library Web site in providing reference service.

Over the years, we created Web pages, added links and databases, and believed the site was useful. Like writers without a publisher, however, we had no objective indication that our work was reaching its audience. As Hampshire students became more technologically proficient and had Internet access on their dorm computers, we feared they would visit the physical library less and less. Usage statistics indicated that students were accessing our resources, but we needed to be sure they were using the site successfully.

We first considered usability analysis in February 2001 but had two major concerns. We worried that the testing process would take too much of our time and that we would not be able to find enough students to compose a viable test group. In fact, both of these concerns proved unfounded, and we conducted two rounds of usability tests between April and August 2001. From our experience, I am convinced that even a small library staff can effectively implement a successful usability study. I will describe the process of moving from early draft to polished design and offer my favorite usability resources.

First Draft of the Site

When I arrived at Hampshire, I promptly became acquainted with the library's Web site. Due to a systems crash, I had to quickly regenerate the entire library site to ensure that it was functioning at the start of the fall semester. Jakob Nielsen and Keith Instone have written extensive usability guidelines for software and Web site design, and I incorporated their ideas into the library site. (See Usability Guidelines sidebar.)

The home page listed many resources to minimize the number of clicks required to access useful material. It linked directly to the online catalog, our electronic databases, and basic information about the library, such as circulation policies and hours of operation. Each second-tier page offered navigational breadcrumbs to assist users. Subject pages linked to subject-specific databases and Web sites; these pages were very long, so static hyperlinks pointed to



Figure 1: Hampshire library Web Site before redesign

various sections within each page. The entire site contained few graphics to minimize visual distractions and to ensure that pages loaded quickly. (See Figure 1.)

All of the librarians used this version of the library Web site during the academic year 2000–2001, and we taught students to use it as well. I collected usage figures and discovered that there had been more than 50,000 hits on the Web site and more than 30,000 searches conducted in our various databases in fiscal year 2001. So we knew that the site and its resource were being used. But as reference librarians, we were concerned about the usefulness of our subject pages, as they contained essential information for student research. We reviewed the library literature and read stories of university libraries' successful usability studies—and we became intrigued by the thought of obtaining usability information about our own site.

Testing the Original Site

Students are our primary patrons, so we planned to focus the test on them. We wanted to know how students accessed our databases—was it by chance, or did they go directly to a certain page, confident of finding the right resource? The subject librarians needed to know if students were using links to their carefully selected Web resources. I was interested to discover hidden navigation or other usability problems.

To address these issues, we developed a set of test questions. We had to be careful to include only questions that would test the library's Web site. One of our

early questions was "How would you renew a book online?" While this question did address an important aspect of students' online research, watching students navigate the online catalog would not demonstrate the usability of our Web site. Instead, our final set of questions focused on how students moved around the academic subject pages and whether they could find general information about the library. (See Test Questions sidebar.)

We conducted one pre-test with a student employee to ensure that the questions worked and the librarians were comfortable with the testing and observing procedure. (To avoid bias in the testing process, I was not part of the test admin-

istration.) We then conducted the first round of tests in April 2001 with six students who responded to our advertisements for Web site testers. Students were tested individually in a librarian's office, where one librarian read questions to each student participant while a second served as the note-taker. We gave each student a \$10 gift certificate to the college bookstore as thanks for participating.

The script included a moderators' guide with an introduction to the test and an explanation of how it would be conducted. The moderator read the introduction and stated that the study was evaluating the Web site and not the student tester's performance. She asked each student her or his major and year at Hampshire and inquired about her or his experience with the library's Web site. During the test, each participant was asked to work through the initial questions and explain steps taken to find the answer. The note-taker wrote brief comments about where participants clicked; she also indicated whether or not participants used the search engine or site map.

The test concluded with six follow-up questions. The testing librarians asked the students to describe problems with the library Web site that had not been raised during the test. The final conversation was a good supplement to the test questions; students offered constructive and spontaneous feedback about the site. Most tests were conducted within 30 minutes from

Test Questions

1. Where are the databases for American history topics?
2. Where are links to an online dictionary?
3. When is the library open until 2 a.m.?
4. Can you find some books on contamination of drinking water?
5. Find a page that links to Massachusetts teacher certification requirements.
6. Which librarian would you ask if you had a question about doing research in architecture?
7. Can you find a page that lists all available electronic journals?
8. Where can you ask a reference question through the library's Web page?

Research by Subject Links

Internet research

Research by [subject](#) (web sites recommended by Hampshire librarians) ... [searching the Internet](#) ... [citing the Internet](#) ... [evaluating web sites](#) ... [other library catalogs](#)

Figure 2a: Text link to Hampshire's subject pages, before redesign



Research by Subject

Figure 2b: Initial graphic link to Hampshire's subject pages, after redesign



Research by Subject Web Sites and Journal Articles

Figure 2c: Expanded graphic link to Hampshire's subject pages, after redesign. This image appears when a user rolls her mouse over the initial graphic.

sub-sites looked too similar: They couldn't visually distinguish between the subject pages and the ready reference pages.

Ultimately, we were surprised by the students' confusion in different areas of the site. We had expected some, but we thought that we had minimized library jargon and provided good navigational cues. On the other hand, we were relieved to find that students could navigate quickly to traditional library resources such as our hours of operation. Most surprisingly, we found that the test functioned as an instructional tool for our testers: Many students told us that they had learned new things about the library Web site.

Applying What We Learned

I collected data from my colleagues and contemplated the task of editing the site to make it more usable. I remained surprised by the students who had stared at the screen with the mouse poised over the correct links without reading the explanatory text below them. I'm not a fan of fancy graphics, but I vowed to follow the advice of the University of Arizona usability team, which advocates a design that "... fits the user, rather than one that makes the user fit the design." So I installed Fireworks on my computer and began creating graphics to guide students through our Web site.

I merged content-appropriate icons with section header text on the home page and used these icons consistently throughout the site. For example, I used a computer icon to identify the Research by Subject section on the home page, and I used that icon on the top of each subject page. (See Figure 2b.)

Further, I made all section headers into roll-over graphics. Initially, the section headers appear to be mere words adjacent to icons. But when a mouse moves over the words, an explanation appears next to the text. I designed these mouse-overs to assist the uncertain users who stared at the screen with the mouse hovering over the links. (See Figure 2c.)

During the test, students looked at subject pages but didn't see the links to material below the first screen, nor did they use the static links provided. To address this problem, I added pull-down menus that link to different segments on the subject pages, including Journal Articles and Web Sites. I hoped that students would be

start to finish. At the end of the entire testing process, the note-taker gave me completed forms for data entry and analysis.

Evaluating Students' Use of Our Site's First Draft

The first round of testing indicated both successes and flaws with the initial design. Students found items that were clearly marked, such as the library's hours of operation. However, they did not find more academic elements of the site such as essential Web sites deep on the Education Subject page.

"The first round of testing indicated both successes and flaws with the initial design."

As with all writing, language was key in both the successes and failures. The usable parts of the site worked because the language to define them was clear: Our students know what "hours" means

in a library context, so the hyperlink labeled "hours" was self-explanatory. Students seemed to have the most trouble with language on the site that was vague or confusing. For example, students did not attempt to find links to journal articles within specific disciplines via a link labeled Internet Research. Test-takers rarely went to our Research by Subject pages to answer discipline-specific questions, and when they did, they did not see the links on the lower half of the page. Students frequently confused the concepts Internet Research and Reference Shelf. (See Figure 2a.)

The testers also observed a very odd phenomenon: As students contemplated which link to select, they stared at the screen with the mouse resting on the correct choice—without following the link! Students did not read the link's description; instead of clicking on the correct link, they moved to another part of the Web site. Essentially, if text wasn't hyperlinked, students didn't read it. In writers' terms, the language wasn't right for the audience.

During the wrap-up sessions, students offered conflicting comments about the use of graphics and text on the site. Many explicitly requested more graphics, while a few commented that they wanted more textual explanation of what was behind each link. Students commented that the

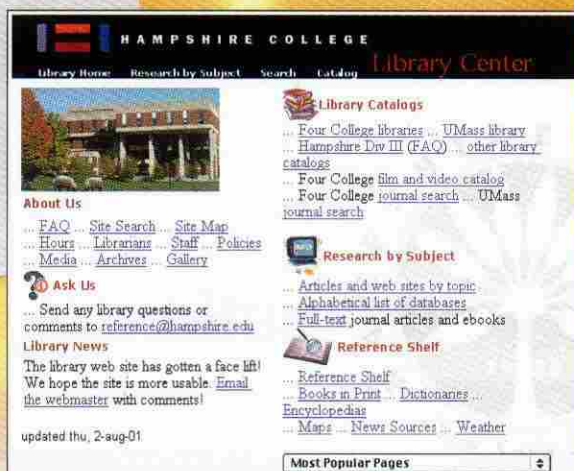


Figure 3: Hampshire library Web Site after redesign

more likely to click on a pull-down menu and become aware of the options than to stare blindly at static text.

Finally, I made several adjustments to incorporate usability principles. I renamed links to each subject page to make them consistent throughout the site. I redesigned the subject page template to distinguish it from other sub-sites such as the reference and policy pages. I included multiple links to important resources, mostly through a new Alphabetical List of Databases page. Finally, I shortened link descriptions throughout the site. (See Figure 3.)

Test, and Then Test Again

I completed the first redesign in July and proposed a second round of usability testing. After all that work, I wanted to ensure that the changes were successful! Students were in short supply, so we recruited the library's three summer work-study students to test the site. (Although they worked in the library, the second round of testers did not have more experience with our Web site than did the first set, so they were suitable candidates.) We followed the testing procedure established in the first round: A two-librarian team asked questions and took notes as students used the library's Web site to answer our mock-research questions.

We did not uncover serious usability problems in this round of testing, although we did observe a few rough patches. The phrases "Research by Subject" and "Reference Shelf" still confused students: They clicked on the Reference Shelf to find databases but not to find Bartlett's Quotations. Students browsed the Alphabetical List of Databases page to find a database in a particular subject, rather than going

directly to a Research by Subject page. In fact, one student told me after the testing that she thought the Research by Subject pages would *not* have links to journal articles. Students moved through the site differently than we had intended, but although they didn't take our ideal path, their overall success rate increased. They used our redesigned Research by Subject pages more than they had in the first round, and we observed them clicking on pull-down menus or scrolling down far enough to see the Web site links on the subject page.

Students were demonstrably better able to find what they needed and were clearly less frustrated by the redesigned site. The usability testing again served as

a teaching tool to those student-testers; they often commented, "I didn't know I could do that!"

"As a tangible sign of the site's value, both Web site hits and overall database searches increased almost 50 percent in the year following the redesign."

I made further changes after the second round of testing, largely due to my revised perception of how Hampshire students use the site. Because they gravitated toward the Alphabetical List of Databases page, I prioritized completeness and accuracy of that resource. I added a Search button at the top of each page to encourage students to search the

Usability Guidelines


Keith Instone, Jakob Nielsen, and Steve Krug all provide common-sense approaches to good Web design. These are the guidelines I use most often when designing pages:

- Both Instone and Nielsen stress that speaking the users' language is critical; we need to minimize library jargon.
- Nielsen says that users need to know both "where am I?" and "where can I go next?"
- Instone recommends that a "home" button be placed on every Web page.
- Nielsen strongly supports consistency of language and actions; Instone furthers this argument by recommending consistent link-, title-, and header-naming conventions.
- Instone and Nielsen both advocate the use of aesthetic and minimalist design.
- Krug suggests cutting explanatory text in half, and then cutting it in half again.

site. I changed the link to the reference librarians from Reference Desk to Librarians to distinguish it from the Reference Shelf. These tweaks were minor in comparison to the changes I had made after the first round, but they further increased the site's usability.

Measures of Our Success

We were thrilled to discover that this brief testing illustrated strengths and weaknesses of our existing site. From the data, I created a site that is similar in structure to our older Web site, while also more functional for students. The site's architecture did not change: We retained our separate subject, reference, and library information sites all linked from the main page. However, because language was problematic, we changed the terms used to describe essential library functions such as reference and Internet research. Finally, we realized the need for greater use of graphics throughout the site and incorporated some descriptive images in troublesome areas.

Over the past year, we have remained satisfied with the site redesign. We ourselves use the improved site for our own work and in the work that supports faculty and students. It is easy to teach, both in large groups of students and one-on-one. I have watched students move through the site to find useful resources. As a tangible sign of the site's value, both Web site hits and overall database searches increased almost 50 percent in the year following the redesign. Since more students than ever before are doing research from their rooms or at odd hours, our Web site should be understandable and useful. Our usability testing and redesign greatly improved the value of this essential reference tool. 

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formation Science in Boston. Her e-mail address is swbrown@hampshire.edu.

Further Reading

Examples of Library Usability Studies

- Battleston, Brenda, Austin Booth, and Jane Weintrop. 2001. "Usability Testing of an Academic Library Web Site: A Case Study." *The Journal of Academic Librarianship* 27, no. 3:188-198.
- Dickstein, Ruth and Vicki Mills. 2000. "Usability Testing at the University of Arizona Library: How to Let the Users in on the Design." *Information Technology and Libraries* 19, no. 3:144-151.
- Hennig, Nicole. 1999. Web Site Usability Test: Introduction: MIT Libraries: March 1999. <http://macfadden.mit.edu:9500/webgroup/usability/results>.
- McMullen, Susan. 2001. "Usability Testing in a Library Web Site Redesign Project." *Reference Services Review* 29, no. 1:7-22.

Usability Heuristics

- Instone, Keith. 1997. Site Usability Heuristics for the Web. http://www.WebReview.com/1997/10_10/strategists/10_10_97_2.shtml.
- Krug, Steve. 2000. *Don't Make Me Think! A Common Sense Approach to Web Usability*. Indianapolis: New Riders Publishing.
- Nielsen, Jakob. 1994. Ten Usability Heuristics. http://www.useit.com/papers/heuristic/heuristic_list.html.

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